

REFERENCES AND EVIDENCE RELATED TO KNOWLEDGE TRANSMITTED FROM INDIA TO EUROPE DURING THE COLONIAL ERA AND OTHER PERIODS

----- Forwarded message -----

From: **Arvind Kumar** <arvind.kumar@gmail.com>

Date: Thu, Nov 13, 2014 at 9:06 AM

Subject: References and evidence (including academic) for various points in our submission

To: Tom Adams <tadams@cde.ca.gov>, IQC <IQC@cde.ca.gov>

Cc: "Angel J. Barrett" <abarr5@lausd.net>, kbennett@santapaulaunified.org, Ed DSouza <edsouza@rialto.k12.ca.us>, Jose.dorado@sbcglobal.net, robert_foster@redlands.k12.ca.us, lori.freiermuth@sweetwaterschools.org, Marlene Galvan <mgalvan@dinuba.k12.ca.us>, cbherrera@mac.com, Bill Honig <billhonig@comcast.net>, Jo Ann Isken <jisken1@gmail.com>, njmctygue@ucdavis.edu, drbrianmuller@gmail.com, Socorro Shiels <sshields@srcs.k12.ca.us>, spykerman_j@auhsd.us, culloa@oldadobe.org, lauryn.wild@sbcusd.com

This mail provides references/evidence for points made earlier and it is not necessary to go through it unless you need either evidence or new ideas for expanding the points in our submission.

The focus of this mail is not merely on knowledge available in India in the ancient times, but on knowledge TRANSMITTED to Britain/Europe from India and which is part of our lives today and for which due credit is not given to India.

Germ Theory and Inoculation

JZ Holwell's famous paper published in 1767 addressed to the College of Physicians in London describing inoculation in India also mentioned that Indians claimed that "imperceptible animalculae" were the cause of diseases. That is he attributed germ theory to India.

Note that there are early texts in India with the idea but my focus is to prove that Europeans got the idea from India.

Holwell's paper is at <http://books.google.mv/books?id=BcEPAAAAQAAJ&pg=PA367>

and the text form is at <http://www.reformation.org/holwell.html> and many other places.

Edward Jenner allegedly "discovered" vaccination in 1796. Holwell's paper was also published on the front page of London's newspaper Times in 1789.

Discovery of Everest as the highest peak

If Lewis and Clark get the credit for their discoveries instead of Thomas Jefferson, then there is no reason why CDE should deny Radhanath Sikdar the credit for discovering the fact that Everest is the highest mountain peak in the world. The name Everest is misleading as Everest was a bureaucrat who had long retired when Sikdar made his discovery of the highest peak in the world.

http://en.wikipedia.org/wiki/Radhanath_Sikdar

JC Bose and the invention of radio

While Marconi was certainly the first to transmit the first VOICE signal, JC Bose was the first to send the first wireless signal and rang a bell and fired a pistol remotely. Marconi built upon Bose's work.

A relatively recent paper by DT Emerson of National Radio Astronomy Observatory at Tucson, AZ has the details.

<https://www.cv.nrao.edu/~demerson/bose/bose.html>

Notice the lines, "The first successful wireless signalling experiment by Marconi on Salisbury Plain in England was not until May 1897. The 1895 public demonstration by Bose in Calcutta predates all these experiments."

This paper was published in IEEE which is the top journal for Electrical Engineers. Another IEEE paper published in 1997 also acknowledged that Marconi used Bose's notes.

A report on 4 Dec 1896 acknowledged that Bose sent signals without wires. The date precedes Marconi's demonstration in May 1897.

<http://books.google.com/books?id=eLcaAAAAYAAJ&pg=PA786&dq=chunder+bose+hertz&hl=en&sa=X&ei=9f6hT8ChKMH42QXd6p3lCA&ved=0CEAQ6AEwATgo#v=onepage&q=chunder%20bose%20hertz&f=false>

News report from Boston Evening transcript published in Jan 1897 describing Bose as the inventor of wireless telegraphy.

<http://news.google.com/newspapers?nid=2249&dat=18970109&id=JW8-AAAAIBAJ&sjid=4lkMAAAAIBAJ&pg=3254,907659>

Popular Mechanics in 1912 mentioned that Bose was the first man to send a wireless message.

<http://books.google.com/books?id=A94DAAAAMBAJ&pg=PA560&lpg=PA560&dq=chunder+bose+popular+mechanics&source=bl&ots=pnEFjwXBli&sig=DxvFxJL026Lp4H4H2Ah6DPLYMjw&hl=en&sa=X&ei=2YJhVNDhJsmVuATrsoDADw&ved=0CB4Q6AEwAQ#v=onepage&q=chunder%20bose%20popular%20mechanics&f=false>

1897 interview with Bose and Marconi in McClure's Magazine reproduced at archive.org (note that Bose is described as Marconi's predecessor)

http://archive.org/stream/mccluresmagazinev8mccl/mccluresmagazinev8mccl_djvu.txt

There was also a BS thesis by a Cornell University student in 1897. This one is 'A Study of the Effect of the Hertz Waves on the Bose Coherer' by Eunice Stebbins.

Modern rockets came from India and British learnt about them from India

William Congreve reverse engineered rockets from India and named it after himself. Rockets in wars were unknown outside India because India had developed steel casing and used rockets effectively. Britain only used rockets for the first time in the Napoleonic wars.

See paper by Simon Warrett from the Department of History at the University of Washington.
<http://rsnr.royalsocietypublishing.org/content/63/1/35.full>

Excerpts from the paper: "Congreve's efforts to imitate Indian war rockets used against the British in Mysore are set within a number of local... Congreve responded by erasing both distant Indian and local British contributions to the rocket system."

It is very easy to find more links by searching in books.google.com and scholar.google.com.

Origin of Steel (wootz) in India and their use in construction

History at the Indian Academy of Sciences:
<http://www.ias.ac.in/resonance/Volumes/11/06/0067-0077.pdf>

You could search for wootz in books.google.com and you will find hundreds of results from the 19th century showing that the British were studying wootz in India and were attempting to learn the process. One example is this one:

<http://books.google.com/books?id=RRxRAAAAYAAJ&pg=PA47>

<http://books.google.com/books?id=0uZZAAAAYAAJ&pg=PA664>
(published in 1840)

Book on architecture and building published in 1868 says Indian wootz is superior and is imitated in America:

<http://books.google.mv/books?id=y5VDAQAAMAAJ&pg=PA450>

Note that Salem District in the following excerpt refers to Salem in India and this one actually tells you about the use of Indian steel in construction:

<http://books.google.com/books?id=gSU6AQAAMAAJ&q=%22indian+steel%22+bridge&dq=%22indian+steel%22+bridge&hl=en&sa=X&ei=B3thVPCwK8-2uASc6YA4&ved=0CEUQ6AEwBTge>

"Even in quite recent days **Indian steel** was in considerable demand in England. Its production was the cause of much wonderment, and was accounted for by various theories.

The famous Damascus blades had long attained a reputation for pliability, strength, and beauty, ere it was known that the material from which they were made was the product of an obscure Indian village, and it is probably not very generally known that a large quantity of the excellent iron used in the construction of the Menai Suspension and the Britannia Tubular Bridges, was from the Porto Nevo Works in South Arcot in Salem district."

Logic

Historical sketch of logic described in a book published in 1851 describes some ancient logical systems of India which resemble those in Europe.

Note that Immanuel Kant's works have similarities with the brief description in the book.

http://books.google.mv/books?id=IQVDAQAAMAAJ&pg=PA380&dq=logic+india&hl=en&sa=X&ei=F6BhVMuyJ9SPuAT11ILQBw&redir_esc=y#v=onepage&q=logic%20india&f=false

George Boole's wife also wrote a piece entitled 'Indian thought and Western science in the nineteenth century' in which she argued that Charles Babbage, de Morgan and George Boole were Hinduized and that had an effect on the mathematical atmosphere of 1830-1865.

<http://www.scribd.com/doc/61916350/Indian-Thought-and-Western-Science-in-the-Nineteenth-Century>

A recent book mentions the above paper.

<http://books.google.mv/books?id=oY99oqHLPaEC&pg=PA7&dq=george+boole+india&hl=en&sa=X&ei=EqRhVJyeHI2iugSkxYLYDA&ved=0CBsQ6AEwAA#v=onepage&q=george%20boole%20india&f=false>

The three names, Babbage, Boole (of boolean algebra fame) and de Morgan are huge names in the fields of mathematics and computer science for formalizing ideas based on logic.

Astronomy

British awed at Indian ability to predict eclipses accurately. Book was published in 1807.

<http://books.google.com/books?id=qlzwAAAAMAAJ&pg=PA226&dq=predict+eclipse+benares&hl=en&sa=X&ei=vN9LU5CEG5Ll8gH114HoDg&ved=0CDUQ6AEwAA#v=onepage&q=predict%20eclipse%20benares&f=false>

Evidence of actual transmission of the idea to Europe as M. le Gentil observes the calculation of a brahmin in India. Book was published in 1835.

http://books.google.com/books?id=w3E_AQAAMAAJ&pg=RA1-PA91&dq=predict+eclipse+india+accurate+le+gentil&hl=en&sa=X&ei=j-BLU4exBsmG8QHfhYCwDQ&ved=0CC0Q6AEwAA#v=onepage&q=predict%20eclipse%20india%20accurate%20le%20gentil&f=false

An 1823 book mentions the "celebrated observatory" at Benares as also the Indian astronomical tables and ability to calculate the details of eclipses.

<http://books.google.com/books?id=a8QnAAAAMAAJ&pg=PA11&dq=observatory+benares+eclipses&hl=en&sa=X&ei=DOFLU9P8DKPo8QHez4CwDw&ved=0CEUQ6AEwAw#v=onepage&q=observatory%20benares%20eclipses&f=false>

A 1797 description of the observatory at Benares.

<http://books.google.com/books?id=c4BMAAAAMAAJ&pg=PA174&dq=observatory+benares+eclipses&hl=en&sa=X&ei=QuFLU6K5HebR8AHt44DIBw&ved=0CDQQ6AEwAQ#v=onepage&q=observatory%20benares%20eclipses&f=false>

Madras System of Education

A British colonizer observed the teaching method in India whereby senior students were asked to tutor the younger students. This system became popular and is still in vogue today in universities in USA.

Evidence of transmission of the idea including the name "Madras System of Education" from a book published in 1812.

<http://books.google.mv/books?id=G4leAAAACAAJ&pg=PR11&dq=madras+system+education&hl=en&sa=X&ei=k7JhVLzxL5TmuQTL0IGwBw&ved=0CCEQ6AEwAQ#v=onepage&q=madras%20system%20education&f=false>

Indian Shipbuilding (Naval Chronicles published in London in 1799)

The following describes Indian shipbuilding in Surat and states that Indian ships last longer than European ships.

<http://books.google.com/books?id=8iMoAAAAYAAJ&dq=The%20Naval%20Chronicle%20surat&pg=PA136#v=onepage&q&f=false>

Greek travel to India in quest of science

Voltaire writes that the Greeks traveled to India in quest of science. Pythagoras is mentioned by him if you continue reading into the next page after clicking the link.

<http://books.google.mv/books?id=J6AOHvwva9UC&pg=PA32&dq=%22The+Greeks,+before+Alexander,+travelled+into+India%22+voltaire&hl=en&sa=X&ei=X7hhVIDeGJCvuATYloLYBg&ved=0CCYQ6AEwAg#v=onepage&q=%22The%20Greeks%2C%20before%20Alexander%2C%20travelled%20into%20India%22%20voltaire&f=false>

Fibonacci and Hindu Numerals

This is a translation of the book by the famous mathematician Fibonacci who introduced Hindu numerals into Europe.

On page 617, a note explains that he uses the term 'Indian figures' to describe 'Hindu numerals.'

http://books.google.mv/books?id=PilhoGJeKBUC&pg=PA4&lpg=PA4&dq=%22hindu+numerals%22+fibonacci&source=bl&ots=LlgWY2eaR7&sig=IeAGVu3_5ykuSyH3aCRPewnl5GI&hl=en&sa=X&ei=17thVM12w4C7BPqggvgN&ved=0CCkQ6AEwBA#v=onepage&q=%22hindu%20numerals%22%20fibonacci&f=false

Linguistics

The entire field of linguistics owes its existence to the study of Sanskrit and without studying Sanskrit, there can be no field of linguistics. This is because every pioneer of the field used the study of Sanskrit to contribute ideas. Sanskrit is unique in being thorough in its rules such that a language can be generated out of the rules alone without ambiguities.

Most conclusions of today's linguists are simply ideas that already exist in Sanskrit grammar and which they have studied. This is true of linguists starting from Wilhelm von Humboldt to

Paul Thieme of the first half of the twentieth century to contemporary linguists such as Noam Chomsky all of whom credit Sanskrit (and people like Panini who were responsible for Sanskrit grammar).

The webpage of the noted linguist Winfred P Lehmann who developed the department of linguistics at University of Texas.

<http://www.utexas.edu/cola/centers/lrc/books/readT.html>

This page has a list of 19th century linguists and what is common to almost all of them is that they formulated their ideas after studying Sanskrit.

For example, Friedrich von Schlegel who is mentioned on the page wrote a book with the title *Über die Sprache und Weisheit der Indier* (On the Language and Wisdom of India).

See http://en.wikipedia.org/wiki/Karl_Wilhelm_Friedrich_Schlegel

A google search for the father of linguistics says that Ferdinand de Saussure is the father of the field. Although he lived in the latter half of the 19th century making this widely accepted claim questionable, even accepting it does not change the fact that Sanskrit contributed to linguistics as de Saussure too was a professor of Sanskrit!

http://en.wikipedia.org/wiki/Ferdinand_de_Saussure

Quote from the Wikipedia page of Franz Bopp who is mentioned on Lehmann's page above. http://en.wikipedia.org/wiki/Franz_Bopp

Martineau also wrote: "Bopp's Sanskrit studies and Sanskrit publications are the solid foundations upon which his system of comparative grammar was erected, and without which that could not have been perfect. For that purpose, far more than a mere dictionary knowledge of Sanskrit was required.

Noam Chomsky too wrote in 1964:

books.google.com/books?id=u0ksbFqagU8C&pg=PR5&dq=chomsky+panini&hl=en&sa=X&ei=M8ZkVKLIK8i0uATX1YFQ&redir_esc=y#v=onepage&q=chomsky%20panini&f=false

What is more, even Panini's grammar can be interpreted as a fragment of such a generative grammar...

-Arvind